

Received January 11, 1768.

VI. *Observations made on the Islands of Saint John and Cape Briton, to ascertain the Longitude and Latitude of those Places, agreeable to the Orders and Instructions of the Right Honourable the Lords Commissioners for Trade and Plantations: By Captain Holland, Surveyor General in Canada, and his Assistants. Communicated by R. Brocklesby, F. R. S.*

Read March 3, 1768. **T**HE instruments made use of, in these observations, were;

I. A monthly astronomical clock, or time-piece (with a compounded pendulum, and a spring to keep it going when the clock is wound up), made by the late Mr. George Graham.

II. An astronomical quadrant, or equal altitude instrument of two feet radius, divided by Mr. Sisson, and improved, with an horizontal circle and stand, by Mess. Heath and Wing.

III. A two feet Gregorian reflecting telescope, made by Mr. Short.

IV. A ten feet refracting telescope, reverfing the objects, made by Mr. Dollond.

In

In building my winter habitation on Saint John's Island, I constructed a strong stone chimney; to the back of which I secured the clock with the greatest precaution; and the room was kept temperate by an iron stove. In a few days, the clock was regulated to mean or equal time; and always examined and compared by equal altitudes of the sun and stars, at or near the time when any immersions or emersions were to be observed. As the going of this clock is not inferior to any made by that renowned artist Mr. Graham; it will not be necessary to insert here a multitude of equal altitudes of the sun, and other observations, to prove the exactness of this clock; but only mention, that I have made use of Monsieur De la Lande's Tables \* to rectify the equal altitudes of the sun, for the alteration of the sun's declination during the time of observations.

1765.

1 Obser. January 20. Observed an emersion of the first satellite of Jupiter, at 7 hours, 42 minutes, 3 seconds, equal or mean time. Mr. Haldimand, who observed with Mr. Dollond's telescope, perceived the satellite two seconds later than I did with Mr. Short's; the latter having the second power magnifying 150 times. As this was the first observation, we began too soon to observe, and fatigued our eyes too much, that we were not sure to a few seconds.

\* See Monsieur De la Lande's *Astronomie*, Article 637, page 279.

2 Obser.

2 Obser. January 27. The first satellite of Jupiter emerged at 9 hours, 36 minutes, 31 seconds, mean or equal time. By bringing Mr. Short's telescope out of a warm room, into the excessive cold air, the mirror became very dull, by which I lost my observation; but Mr. Haldimand was sure of his being good.

3 and 4 Obser. March 23. The third satellite of Jupiter in immerging began to appear faint at 9 hours, 4 minutes, 48 seconds, and intirely immersed at 9 hours, 5 minutes, 47 seconds; and in emerging began to appear faintly at 12 hours, 27 minutes, 52 seconds, and fully recovered its lustre at 12 hours, 27 minutes, 58 seconds, equal or mean time. Observed by us both.

5 Obser. April 6. The first satellite of Jupiter in immerging appeared faintly at 10 hours, 15 minutes, 54 seconds, equal time, and recovered its full lustre in 4 seconds afterwards. Observed by us both.

6 Obser. April 21. The first satellite of Jupiter emerged at 8 hours, 34 minutes, 51 seconds, and recovered its full lustre in 3 seconds afterwards. Observed by us both.

7 Obser. April 29. The first satellite of Jupiter emerged at 10 hours, 29 minutes, 30 seconds, equal time. Observed with Dollond's telescope only.

By the mean of all the meridian altitudes of the sun and stars; the latitude of this place is  $46^{\circ} 2' 30''$  north.

In the beginning of May, I went on the survey of Saint John's Island; and lieutenant Haldimand  
to

to survey and settle the latitude and longitude of the Magdalen Islands.

The longitude, lieutenant Haldimand determined by the mean result of several observations of the distance of the Moon, from the Sun and fixed stars.

This gentleman would have given a full account of his observations, with some natural remarks on the Sea Cows, which in prodigious numbers resort to that Island, had he not unfortunately lost his life, being drowned presently after his return to Louisbourg.

The result of his observations is ;

The Magdalen Islands are situated in the Gulph of St. Lawrence, in the latitude of  $47^{\circ} 41'$  North, and between  $61^{\circ}$  and  $61^{\circ} 38'$  West longitude from London. The variation of the Compass is  $17^{\circ} 30'$  West.

The Island of Entry, lies in  $47^{\circ} 17'$  North latitude, and  $61^{\circ} 20'$  West longitude from London.

The Bird Islands are in  $47^{\circ} 55'$  North latitude, and bear from the East point of Magdalen North  $35^{\circ}$  East, distant 18 Miles.

Bryon Island is in  $47^{\circ} 52'$  North latitude, and the East point bears North  $13^{\circ}$  West of the East point of Magdalen ; distant 12 miles.

At my arrival at Louisbourg, the 26th October 1765, I brought the instruments in order ; fixed the clock to a brick wall, in a room kept warm by a stove, and regulated it to equal or mean time.

I also put up in a different room, near the fire place, another monthly clock, sent me from London, made by Mess. Mudge and Dutton, with a simple or common pendulum ; this clock, with little trouble, was soon brought to keep time with the other clock, though,

when the fire was neglected, it was soon perceived in its motion.

The weather here proved very disadvantageous for astronomical observations, as well by the continual fogs, as severe frost.

1766.

1 Obser. March 10. Observed by Mr. Thomas Wright and me; the first satellite of Jupiter emerged at 11 hours, 21 minutes, 27 seconds, equal or mean time. This observation was made with the aforementioned instruments, and in the same manner. This day I had taken several equal altitudes to examine the clock, and found it 4 seconds too slow of equal time.

April 7. We discovered a Comet at 8 hours, 52 minutes; the tail of which was perpendicular to the horizon, with its head towards the Sun: the light of it was very pale, and it set behind the hills at 9 hours, 30 minutes. As near as I could remember, its position, when I came to look on the globe, was between the tail of Aries and Musca; we made preparations to make proper observations on the night ensuing; but a fog, which continued for several days, prevented us; and when it cleared up, the comet had so much approached the Sun, that we never after could see it.

2 Obser. April 14. The third satellite of Jupiter emerged at 11 hours, 51 minutes, 47 seconds; but some flying clouds made this observation a little dubious, which also occasioned losing the immersion of the same satellite. Observed by us both.

3 Obser.

3 Obser. April 25. The first satellite of Jupiter emerged at 11 hours, 46 minutes, 50 seconds. Observed by us both.

May 1. The several surveying parties dispersed round this Island, to finish the survey, and take the latitudes of all the most remarkable places; of which the result is;

At Louisburg and Island Battery, the latitude is  $45^{\circ} 54'$  North.

Cape North, latitude  $47^{\circ} 2'$  North.

St. Paul's Island, North cove, latitude  $47^{\circ} 11'$  North.

The entrance of Dartmouth Harbor or *Baye des Espagnols*, latitude  $46^{\circ} 13'$  North.

—Conway or St. Anne's Harbor, latitude  $46^{\circ} 20'$  North.

The North head of Colviles Bay, or Niganiche, latitude  $46^{\circ} 44'$  North.

August 4. I returned to Louisburg, to observe the eclipse of the Sun on the day following. This eclipse appeared here perfectly annular; but I could only observe the undermentioned circumstances, as my large telescope and micrometer were out of order.

I observed with the telescope fixed to my quadrant or equal altitude instrument of two feet long reversing the objects; and Mr. Thomas Watts observed with one of Dollond's, four feet long.

During the time of observation, the sky was very clear, and I took six equal altitudes, to examine the clock.

	h	'	"	
The beginning of the eclipse	12	38	40	} Equal, or Mean Time.
The ring formed	2	8	48	
The ring opened	2	12	6	
End of the eclipse	3	33	50	
	H	2		From

1767.

From this time I was prevented, either by the business of the survey, or by the inconveniency of the weather, to make any further observations, until February 18.

1 Obser. The first satellite of Jupiter immersed at 11 hours, 47 minutes, 10 seconds, mean time.

2 Obser. February 25. The same satellite of Jupiter immersed at 13 hours, 41 minutes, 14 seconds, mean time.

3 Obser. February 27. The same satellite of Jupiter immersed at 8 hours, 10 minutes, 17 seconds, mean time.

4 Obser. March 6. The same satellite of Jupiter immersed at 10 hours, 4 minutes, 29 seconds, mean time.

5 Obser. March 15. The same satellite of Jupiter immersed at 8 hours, 41 minutes, 19 seconds, mean time.

6 Obser. April 7. The same satellite of Jupiter emerged at 8 hours, 53 minutes, 11 seconds, mean time.

7 Obser. April 14. The same satellite of Jupiter emerged at 10 hours, 47 minutes 44 seconds, mean time.

The observations of the immersions and emersions were this year made with Dollond's refracting telescope; the reflecting telescope of Mr. Short being sent with Mr. Wright (one of my deputy surveyors), who went last August to the Island of Anticosti, to survey, make observations for the ascertaining the longitude and latitude, and keep a meteorological journal.

I hope some of Mr. Wright's observations will be made on the same time with mine, that I may be able to settle immediately the longitude of the Island of Anticosti, and the entrance of the river of St. Lawrence. But to determine with exactness the longitudes hitherto taken, it will be necessary to deliver a copy of this paper to some members of the Royal Society, that they may be compared with corresponding observations, made in England.

By order of the Surveyor General.

George Derbage, Sec.